

# LISTED STOCK ADULT ESCAPEMENT MONITORING

9703000

## SHORT DESCRIPTION:

Monitor abundance-based adult salmon spawner information over time, using a passive temporary facility utilizing underwater video technology. This project would allow comparison to redd count survey data on unsupplemented chinook salmon populations (control streams) in the South Fork Salmon River (Secesh River and Lake Creek). Accurate adult escapement information would be collected to allow managers to determine if recovery actions were recovering these unsupplemented populations. It would also allow estimating adult spawner migration timing, morphometric determination of age structure (if possible), and assessment of hatchery straying into the system.

## SPONSOR/CONTRACTOR: NPT

## SUB-CONTRACTORS:

Nez Perce Tribe Department of Fisheries Resources management N/A

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## GOALS

### GENERAL:

Supports a healthy Columbia basin, Adaptive management (research or M&E)

### ANADROMOUS FISH:

Research, M&E

### NPPC PROGRAM MEASURE:

7.1.D2; 7.1C; 7.3.B2

### RELATION TO MEASURE:

The Listed Stock Chinook Salmon Escapement Monitoring project will document the adult escapement characteristics (both morphological and status) of two wild chinook salmon populations as directed in 7.1.D2 and 7.1C. These data will also contribute to the evaluation of supplementation strategies as control populations (7.3.B2).PROGRAM GOAL THE PROJECT

### BIOLOGICAL OPINION ID:

Section 10 permit.

### OTHER PLANNING DOCUMENTS:

snake River Recovery Plan: 4.1.b. "...develop and implement management plans for snake River spring/summer chinook salmon conservation hatchery programs which should include: ..., 4. Monitoring and Evaluation Strategy,..."Wy Kan Ush Me Wa Kush Wit (Draft 6/15/95): 5B-57-58. "Establish and monitor escapement checkpoints at mainstem dams and in each subbasin... Methods to be used include video counting at hydropower dams and at key location in tributaries,...." "Establish additional programs for each of the subbasin tributary systems to monitor adult escapement and resulting smolt production, and to evaluate (by measuring the number of adults returning) the ability of managers to meet goals set by the Columbia River management Plan."

### TARGET STOCK

### LIFE STAGE

### MGMT CODE (see below)

Lake Creek spring-summer chinook salmon

Adult

N, L,W

Secesh River spring-summer chinook salmon

Adult

N, L,W

### AFFECTED STOCK

### BENEFIT OR DETRIMENT

Bull Trout

Beneficial

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## BACKGROUND

### Stream name:

Lake Creek and Secesh River

### Subbasin:

Salmon River

### Stream miles affected:

### Land ownership:

**HISTORY:**

This investigation began in 1991 with planning and a conceptual engineering design of an adult fish counting facility for the Secesh River funded by the Pacific Salmon Treaty. Preliminary design work followed in 1994. Approximately \$125,000 has been invested in the planning process since 1991. The Pacific Salmon Treaty funding was used as seed money to begin the project and Treaty funding is not sufficient to allow full project implementation on the Secesh River and Lake Creek. The Nez Perce Tribe has worked cooperatively with the Idaho Department of Fish and Game (IDFG) and the U.S. Forest Service (USFS) in the planning and developmental stages of this project.

**BIOLOGICAL RESULTS ACHIEVED:**

None to date

**PROJECT REPORTS AND PAPERS:**

Fish management Consultants. 1991. Feasibility design and location of a weir for escapement estimation of summer chinook salmon in the Secesh River, Idaho. Report prepared for the Nez Perce Tribe. Fish management Consultants. Olympia, Washington. River Masters Engineering. 1994. Preliminary design of a non-impeding fish counting facility in the Secesh River for adult summer chinook. Report prepared for the Nez Perce Tribe. River Masters Engineering. Pullman, Washington.

**ADAPTIVE MANAGEMENT IMPLICATIONS:**

The Listed Stock Adult Escapement Monitoring project will provide accurate determination of adult summer chinook escapement into a major unsupplemented summer chinook producing stream; the Secesh River and Lake Creek. Accurate escapement determination will allow managers to monitor the effectiveness of proposed recovery plan actions for stock rebuilding and to evaluate past redd count information. coordination with the ISS outmigration study will allow information on juvenile salmon production and stock recruitment.

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**PURPOSE AND METHODS**
**SPECIFIC MEASUREABLE OBJECTIVES:**

Objective 1: Accurate determination of listed adult summer chinook salmon spawner abundance (escapement) in the major spawning areas in the Secesh River. Objective 2: determination of listed adult chinook salmon escapement into Lake Creek. Objective 3: Evaluation of accurate adult spawner abundance over time in relation to stock recovery and rebuilding. Objective 4: Identification of adult spawning migration timing into the Secesh River and Lake Creek. Objective 5: Comparison of adult abundance with one-time and multiple ground redd count techniques. Objective 6: Assessment of hatchery straying into the Secesh River and Lake Creek.

**CRITICAL UNCERTAINTIES:**

Hydrologically unusual high summer flows during a portion of the migration period could restrict the assembly or necessitate removal of the fish counting facility, resulting in an inability to monitor entire escapement. There is a potential risk that the fish counting station could slightly delay or impede upstream migration.

**BIOLOGICAL NEED:**

Accurate determination of adult salmon spawner abundance is important in managing endangered Snake River chinook salmon. Traditional chinook salmon redd count surveys have relied upon one-time counts as an index of relative abundance (trend) over time in Idaho. These counts have assumed that spawning has been completed, that viewing conditions for aerial surveys were acceptable, and that spawner distribution has remained constant. These surveys did not account for adult salmon straying, pre-spawning mortalities, and differences in redd counting techniques. Subsequently, this information cannot be used for determination of adult spawner abundance in the Secesh River or Lake Creek.

Implementation of this project will result in collection of abundance-based salmon spawner information over time and will allow comparison to redd count survey data. It will allow managers to determine if recovery actions are, in fact, increasing adult salmon returns to unsupplemented (control) stream systems.

## **HYPOTHESIS TO BE TESTED:**

Adult chinook salmon escapement in to the Secesh River and Lake is accurately estimated using various redd count survey methods. Corollary: Rejecting H01a indicates that redd count surveys do not accurately estimate or reflect the actual number of adult chinook salmon in returning to the Secesh River and Lake Creek.

## **ALTERNATIVE APPROACHES:**

The use of conventional adult collection weirs is an alternative option for the collection of adult escapement data. However, the potential for adversely impacting the spawner distribution and survival using obstructive techniques was considered to be above an acceptable risk level. Continuing traditional redd count surveys was also considered. These techniques have assumed that index area counts are reliable indicators of population abundance, that redd count timing is correct, that straying of fish is minimal and does not account for pre-spawning mortality. Accurate escapement determination would determine all adult salmon spawner escapement into Lake Creek and the Secesh River.

## **JUSTIFICATION FOR PLANNING:**

N/A

## **METHODS:**

Project planning for the proposed Secesh River fish counting/video facility project has taken into account questions regarding NMFS standards for barrier/trap facilities. The temporary fish counting station will be installed when stream discharge in the upper Secesh River, below Chinook Campground, declines below 400-500 cfs in late June or early July. A second fish counting facility will be installed in lower Lake Creek during the same period. Components of the proposed temporary fish counting facility include tripod-supported upstream guide fences and a video equipped counting chamber. The tripod structures, similar to those in use at the South Fork Salmon River weir, will be weighted down and supported with horizontal braces. A walkway will be installed and supported by horizontal braces and longitudinal supports and cross supports to support walkway grading and hand rails, for maintenance of the structure. The counting fence will be installed at a 45 degree angle across the stream. The counting chamber will be installed in the channel thalweg to encourage adult movement through the chamber and upstream to natal spawning areas. Monitoring and evaluation (M&E) will be in place to determine if adults are being impeded by the fish counting station and sections of the station would be removed if adult upstream movement was impeded.

The temporary fish counting facility will be operated 24 hours a day in a passive manner and maintenance would occur with personnel located on-site or near the site. Project biologists will monitor and evaluate the fish counting facility for impedance of adult upstream movement according to the M&E plan. Video tapes will be replaced at intervals as necessary to ensure that the continuous sampling strategy was employed. No adult summer chinook salmon will be trapped or handled during the conduct of this project. River stage and water temperature will be recorded daily for comparison to adult movement patterns.

Analysis of the video tapes will allow a record of the actual count and timing of movement of adult summer chinook salmon into the Secesh River below Chinook Campground.

The adult summer chinook fish counting facility will be operated and refined to develop accurate baseline escapement information into the Secesh River and Lake Creek. Adult escapement information as determined by this project will be compared to annual redd counting surveys to evaluate the accuracy of those techniques.

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## **PLANNED ACTIVITIES**

### **SCHEDULE:**

<b><u>Planning Phase</u></b>	<b><u>Start</u></b> 1991	<b><u>End</u></b> 1996	<b><u>Subcontractor</u></b>
<b><u>Task</u></b> Development and assessment of fish counting stations and evaluation of potential site locations.			
<b><u>Implementation Phase</u></b>	<b><u>Start</u></b> 1997	<b><u>End</u></b> 2001	<b><u>Subcontractor</u></b>
<b><u>Task</u></b> Installation Operation: coordination with ISS project, collection of water temperature information, discharge information will be collected, video tape replacement, debris removal, and data analysis and report preparation. Monitoring and evaluation: video tape review, snorkel and bank observations.			

**PROJECT COMPLETION DATE:**

2001

**CONSTRAINTS OR FACTORS THAT MAY CAUSE SCHEDULE OR BUDGET CHANGES:**

Approval of NMFS section 10 application and US Forest Service special use permits, including Environmental Assessment, could potentially delay research activities.

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**OUTCOMES, MONITORING AND EVALUATION****SUMMARY OF EXPECTED OUTCOMES****Expected performance of target population or quality change in land area affected:**

We expect to collect and provide accurate determination of adult summer chinook salmon spawner abundance information in the Secesh River and Lake Creek through use of underwater video technology. These streams are representative of unsupplemented summer chinook salmon populations in the South Fork Salmon River.

**Present utilization and conservation potential of target population or area:**

Chinook salmon populations in the Secesh River and Lake Creek have been too low in recent years to support tribal or sport fisheries. Redd count surveys have documented low but adequate return of adults to these systems to allow future harvest opportunities given that current survival limiting factors are corrected.

**Assumed historic status of utilization and conservation potential:**

Historically, Idaho produced a significant portion of the spring/summer chinook salmon returning to the Columbia River. These chinook provided commercial and subsistent fisheries to the Columbia River Tribes. They were also utilized in tribal ceremonies. Additionally, the Columbia River chinook provided a commercial fishery to non-Indians during the turn of the century. The chinook salmon populations in the Secesh River and Lake Creek are key indicator stocks which supported Tribal fisheries.

**Long term expected utilization and conservation potential for target population or habitat:**

The minimum goal is to maintain a chinook fishery at levels to sustain Tribal utilization. The long term desired utilization goal is to restore chinook populations in Idaho to a sport-fishable level.

**Contribution toward long-term goal:**

Restoration of chinook salmon populations are best monitored and evaluated based on adult returns, specifically adult returns to individual tributaries. This research will provide insights into the best hatchery methodology to maintain Idaho's chinook salmon to the extent possible with current mainstem migration and mortality problems. If solutions to Columbia and Snake River survival problems are implemented, adult escapement history in control streams should provide information to guide the rehabilitation of Idaho's chinook salmon populations.

**Indirect biological or environmental changes:**

None

**Physical products:**

N/A

**Environmental attributes affected by the project:**

N/A This is a passive monitoring project.

**Changes assumed or expected for affected environmental attributes:**

N/A

**Measure of attribute changes:**

N/A

**Assessment of effects on project outcomes of critical uncertainty:**

The critical uncertainties and risks identified earlier will be assessed with a monitoring and evaluation plan. This monitoring and evaluation plan (M&E) contains three major components, 1) criteria for determining when impacts associated with the fish counting station are significant to salmon; 2) guidelines for corrective actions; and 3) a plan implementation schedule. Two methods will be used to determine if the fish counting station installation is impeding or preventing fish movement. These include analysis of videotape recordings of fish moving through the fish counting chamber and direct observation of fish in the stream. Direct observations will be made from concealed location on the bank and by snorkeling. These direct observations will also be used to assure that total escapement has been monitored or to estimate a missed portion of returns.

**Information products:**

The results of this project are primarily population status monitoring oriented. However, data will also contribute to the evaluation of redd count techniques and serve as reference (control) streams in the evaluation of supplementation activities.

**Coordination outcomes:**

This project has been coordinated with the Idaho Department of Fish and Game and the U.S. Forest Service. The project has also been coordinated with the National Marine Fisheries Service and Columbia River Inter-Tribal Fish Commission in regard to needs identified under the Endangered Species Act. coordination of results will occur with Idaho Salmon Supplementation project.

**MONITORING APPROACH**

The adult summer chinook fish counting facility will be operated and refined to develop accurate baseline escapement information into the Secesh River and Lake Creek. Adult escapement information as determined by this project will be compared to annual redd counting surveys to evaluate the accuracy of those techniques. The outcomes of this project will best be measured by the degree of refinement of adult escapement estimates for the key indicator populations of Secesh River and Lake Creek chinook salmon.

**Provisions to monitor population status or habitat quality:**

The entire purpose of the study is to accurately monitor population status.

**Data analysis and evaluation:**

Computer aided visual analysis of the video tapes will provide an actual count and timing of movement of adult summer chinook salmon into the Secesh River and Lake Creek. Data including total adult salmon escapement will be quantified and spawning run timing, and morphometries will be determined over time on an annual basis. Adult escapement information will be compared to annual redd counting surveys to evaluate the accuracy of those techniques.

**Information feed back to management decisions:**

Bi-weekly briefings will be held between the on the ground researchers and management personnel within the Nez Perce Tribe. Annual reports summarizing all activities associated with the adult chinook salmon escapement monitoring project will be prepared and distributed.

**Critical uncertainties affecting project's outcomes:**

Construction of a permanent fish counting station designed to operate at higher flows than the current temporary structure will reduce the chances of non-operational periods during migration.

**EVALUATION**

The projects overall performance will best be evaluated on the projects ability to determine total escapement.

**Incorporating new information regarding uncertainties:**

If the criteria for determining if the fish counting station is impacting salmon migration are met, all of the pickets that make up the guides of the counting station will be removed for a period of one week. After the pickets are removed, snorkel and discrete bank observations would be continued in a effort to observe salmon movement. additionally, videotape recording would be continued during this period and reviewed to provide evidence of salmon passage.

#### **Increasing public awareness of F&W activities:**

The goal of the research project is to provide management with the best possible information to improve the status of chinook salmon populations in Idaho. As with all research, any opportunities to inform the public on research activities and resource status will be utilized. Opportunities to interact with the general public at the research site will be encouraged and utilized.

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## **RELATIONSHIPS**

### **RELATED BPA PROJECT**

8909802 Idaho Salmon Supplementation

### **RELATIONSHIP**

Idaho Salmon Supplementation study, Utilize the Secesh River and Lake Creek as control streams for supplementation evaluations, including adult escapement via redd counts.

#### **OPPORTUNITIES FOR COOPERATION:**

This project is coordinated with the Idaho Department of Fish and Game, U.S. Forest Service and Columbia River Inter-Tribal Fish Commission. Potential for sharing evaluations equipment and personnel exists with the Idaho Salmon Supplementation project.

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## **COSTS AND FTE**

**1997 Planned:** \$139,700

#### **FUTURE FUNDING NEEDS:**

#### **PAST OBLIGATIONS (incl. 1997 if done):**

<u>FY</u>	<u>\$ NEED</u>	<u>% PLAN</u>	<u>% IMPLEMENT</u>	<u>% O AND M</u>
1998	\$137,925		100%	
1999	\$125,000		100%	
2000	\$127,000		100%	
2001	\$129,000		100%	
2002	\$133,000			

#### **OTHER NON-FINANCIAL SUPPORTERS:**

IDFG; Columbia River Inter-Tribal Fish Commission

**LONGER TERM COSTS:** Expected annual costs estimated to be approximately \$130,000.

**1997 OVERHEAD PERCENT:** 30%

#### **HOW DOES PERCENTAGE APPLY TO DIRECT COSTS:**

[Overhead % not provided so BPA appended older data.] Indirect cost applies to everything except equipment and consultant services.

#### **CONTRACTOR FTE:**

Fisheries Biologist - 0.5 FTE; Prog. Leader - 0.1 FTE; seasonal Aides - 0.75 FTE; Prog. Mngr. - 0.1 FTE; Contr. Adm. - 0.1 FTE.

**SUBCONTRACTOR FTE:** None

